Heterogeneous Impacts of Credit Constraints in the Presence of Risk Rationing: Evidence from Tanzania

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Abstract

Although theoretical and empirical literature widely suggest adverse effects of credit constraints on farm outputs, identification and estimation of the causal impacts still remain problematic. The difficulty is due to the fact that farmers' credit constraint status is not exogenous – the same observable and unobservable characteristics simultaneously determine both the output of the farm and its credit constraint status. For instance, richer farmers are less likely to be credit constrained but they may also have higher productivity due to newer technology adoption and scale effects. The recent attempt to redefine credit constraint status by including the risk rationed farmers – those who refrain from borrowing due to the risk of losing collateral – may further exacerbate the existing problem of endogeneity because selection based on individual preference (unobservable) is harder to control than observable characteristics such as wealth and farm size. The objective of this study is to assess the econometric implication of self-selection in credit rationing and to estimate the heterogeneous impacts of credit constraints on farm productivity.

Using direct elicitation of credit constraints through a specialized survey in Tanzania coupled with Africa RISING baseline evaluation survey data we identify and estimate the average cost of credit constraint on agricultural productivity for constrained, unconstrained, and the entire sample population. We directly elicit household's credit constraint status for borrowers and non-borrowers using survey-based technique akin to contingent valuation. We have found a modest 13% of households are quantity rationed whereas more than half of the sample (57%) are risk rationed. We employ a generalized version of Heckman's selection model to account for farmers' self-selection based on unobserved heterogeneity and find that the average cost of credit constraint for the entire population of farmers in our study area is about 19% loss in agricultural productivity. If the constraint is removed from a constrained farmer, on average his/her productivity is expected to increase by 11%, and if credit constraint is imposed on an unconstrained farmer, he/she is expected to suffer a very high 38% loss in productivity. We have found that average cost of constraint for the unconstrained set is much higher than that of the constrained set which indicates that the principle of comparative advantage is at work. By estimating heterogeneous response to credit constraint this study not only estimates the average cost of credit constraint for the entire population but also estimates the full distribution of cost of constraint including other important parameters of policy interest such as the average cost of constraint for the constrained and the unconstrained set of households.

Keywords: Credit constraints, Risk rationing, Heterogeneous selection, Tanzania Africa RISING, Average treatment effect